

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

# TD62064BP-1, TD62064BF

## 4ch HIGH-CURRENT DARLINGTON SINK DRIVER

The TD62064BP-1 and TD62064BF are high-voltage, high-current darlington drivers comprised of four NPN darlington pairs.

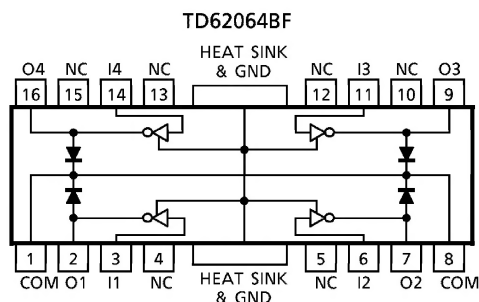
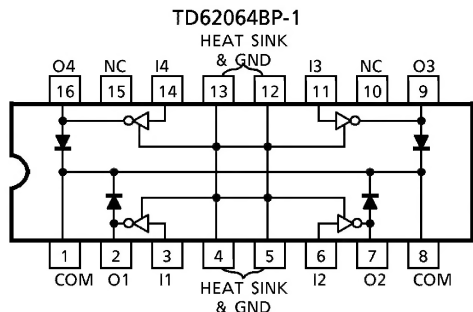
All units feature integral clamp diodes for switching inductive loads.

Applications include relay, hammer, lamp and stepping motor drivers.

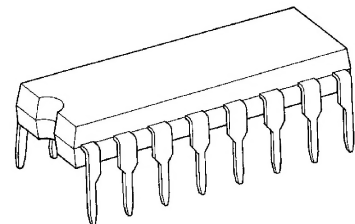
### FEATURES

- Package Type BP-1 : DIP16 pin  
BF : PFP16 pin
- High Output Sustaining Voltage :  $V_{CE(SUS)} = 80V$  (Min.)
- Output Current (Single Output) :  $I_{OUT} = 1.5A$  / ch (Max.)
- Output Clamp Diodes
- Input Compatible with TTL and 5V CMOS
- GND and SUB Terminal = Heat Sink

### PIN CONNECTION (TOP VIEW)

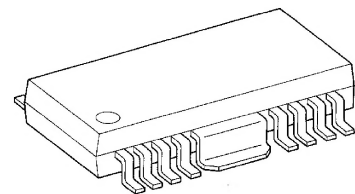


TD62064BP-1



DIP16-P-300-2.54A

TD62064BF



HSOP16-P-300-1.00

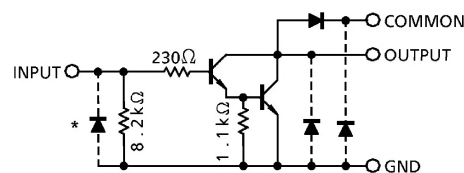
### Weight

DIP16-P-300-2.54A : 1.11g (Typ.)

HSOP16-P-300-1.00 : 0.50g (Typ.)

### SCHEMATICS (EACH DRIVER)

TD62064BP-1 / BF



\* : Parasitic

The input and output parasitic diodes cannot be used as clamp diodes.

961001EBA2

- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- The products described in this document are subject to foreign exchange and foreign trade control laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

**MAXIMUM RATINGS** (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Output Sustaining Voltage		V <sub>CE(SUS)</sub>	− 0.5 ~ 80	V
Parasitic Transistor Output Voltage		V <sub>CEF</sub> *1	80	V
Output Current		I <sub>OUT</sub>	1.5	A / ch
Input Current		I <sub>IN</sub>	50	mA
Input Voltage		V <sub>IN</sub>	7	V
Clamp Diode Reverse Voltage		V <sub>R</sub>	80	V
Clamp Diode Forward Current		I <sub>F</sub>	1.5	A
Power Dissipation	BP-1	P <sub>D</sub>	1.47 / 2.7 *2	W
	BF		0.9 / 1.4 *3	
Operating Temperature		T <sub>opr</sub>	− 40 ~ 85	°C
Storage Temperature		T <sub>stg</sub>	− 55 ~ 150	°C

\*1 Parasitic Transistor (COMMON - GND - OUTPUT) Output Voltage

\*2 On Glass Epoxy PCB (50 × 50 × 1.6mm Cu 50%)

\*3 On Glass Epoxy PCB (60 × 30 × 1.6mm Cu 30%)

**RECOMMENDED OPERATING CONDITIONS** (Ta = − 40~85°C)

CHARACTERISTIC		SYMBOL	CONDITION		MIN.	TYP.	MAX.	UNIT
Output Sustaining Voltage		V <sub>CE(SUS)</sub>			0	—	80	V
Output Current	BP-1 *1	I <sub>OUT</sub>	DC 1 Circuit, Ta = 25°C		0	—	1250	mA / ch
			T <sub>pw</sub> = 25ms 4 Circuits T <sub>j</sub> = 120°C Ta = 85°C	Duty = 10%	0	—	1250	
	Duty = 50%			0	—	380		
	Duty = 10%			0	—	900		
	Duty = 50%			0	—	170		
Input Voltage		V <sub>IN</sub>			0	—	5.5	V
	(Output On)	V <sub>IN(ON)</sub>	I <sub>OUT</sub> = 1.25A		2.5	—	8	V
	(Output Off)	V <sub>IN(OFF)</sub>			0	—	0.4	V
Input Current		I <sub>IN</sub>			0	—	20	mA
Clamp Diode Reverse Voltage		V <sub>R</sub>			0	—	80	V
Clamp Diode Forward Current		I <sub>F</sub>			—	—	1.25	A
Power Dissipation	BP-1	P <sub>D</sub>	Ta = 85°C *1		—	—	1.4	W
	BF *2		Ta = 85°C *2		—	—	0.7	

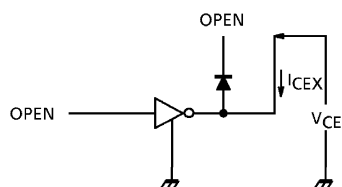
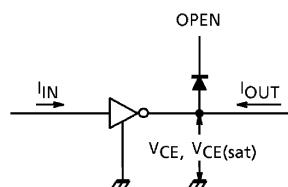
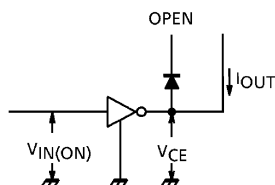
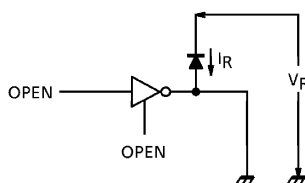
\*1 On Glass Epoxy PCB (50 × 50 × 1.6mm Cu 50%)

\*2 On Glass Epoxy PCB (60 × 30 × 1.6mm Cu 30%)

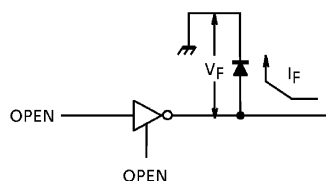
## ELECTRICAL CHARACTERISTICS (Ta = 25°C unless otherwise noted)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Leakage Current	$I_{CEX}$	1	$V_{CE} = 80V, T_a = 25^\circ C$	—	—	50	$\mu A$
			$V_{CE} = 80V, T_a = 85^\circ C$	—	—	100	
Output Saturation Voltage	$V_{CE(sat)}$	2	$I_{OUT} = 1.25A, V_{IN} = 2.4V$	—	—	1.6	V
			$I_{OUT} = 0.75A, V_{IN} = 2.4V$	—	—	1.25	
DC Current Transfer Ratio	$h_{FE}$	2	$V_{CE} = 2V, I_{OUT} = 1.25A$	—	1500	—	
Input Voltage (Output On)	$V_{IN(ON)}$	3	$I_{OUT} = 1.25A, I_{IN} = 2mA$	—	—	2.4	V
Clamp Diode Leakage Current	$I_R$	4	$V_R = 80V, T_a = 25^\circ C$	—	—	50	$\mu A$
			$V_R = 80V, T_a = 85^\circ C$	—	—	100	
Clamp Diode Forward Voltage	$V_F$	5	$I_F = 1.25A$	—	1.5	2.0	V
Input Capacitance	$C_{IN}$	6	$V_{IN} = 0, f = 1MHz$	—	15	—	pF
Turn-On Delay	$t_{ON}$	7	$V_{OUT} = 80V, R_L = 68\Omega$	—	0.1	—	$\mu s$
Turn-Off Delay	$t_{OFF}$			—	1.0	—	
Parasitic Transistor Output Voltage	$V_{CEF}$	8	$I_{CEF} = 150mA$	80	—	—	V

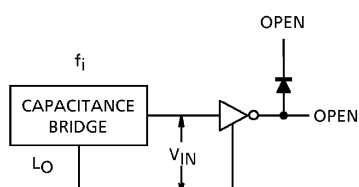
## TEST CIRCUIT

1.  $I_{CEX}$ 2.  $V_{CE(sat)}$ ,  $h_{FE}$ 3.  $V_{IN(ON)}$ 4.  $I_R$ 

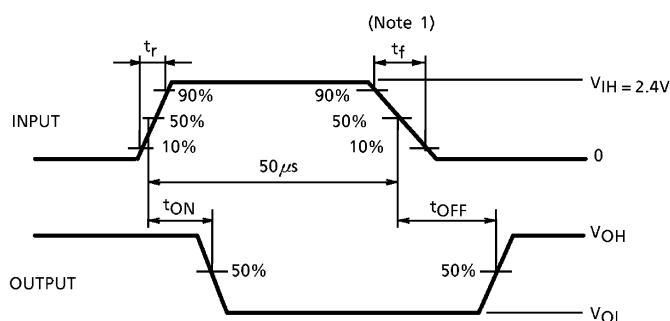
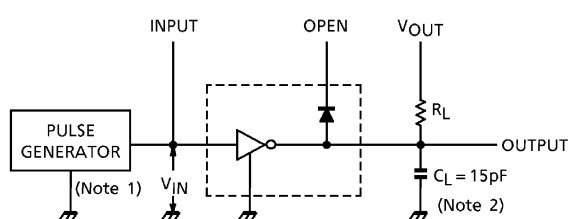
5.  $V_F$



6.  $C_{IN}$

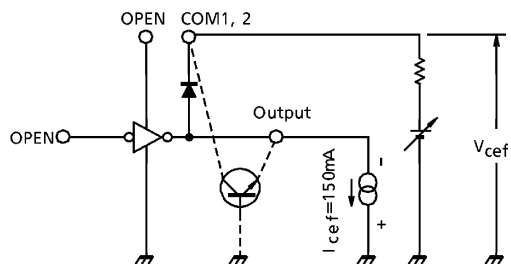


7.  $t_{ON}$ ,  $t_{OFF}$



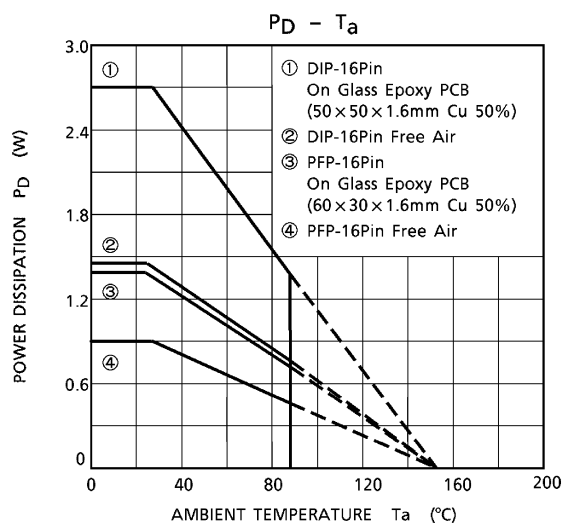
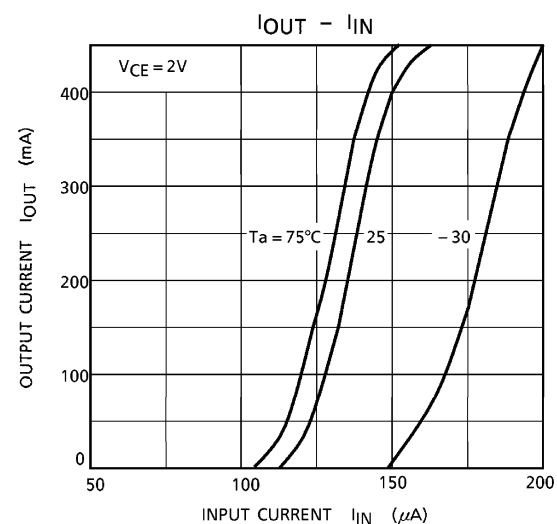
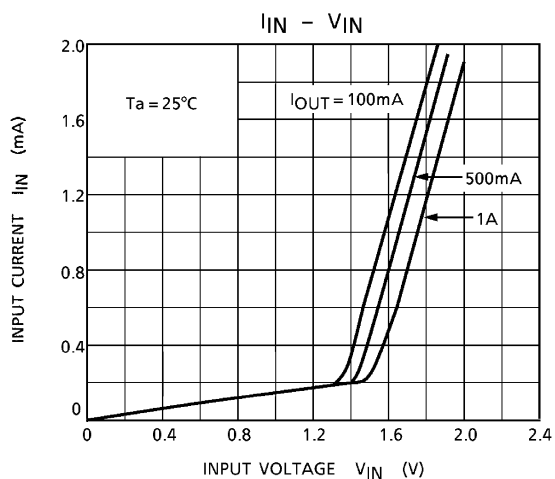
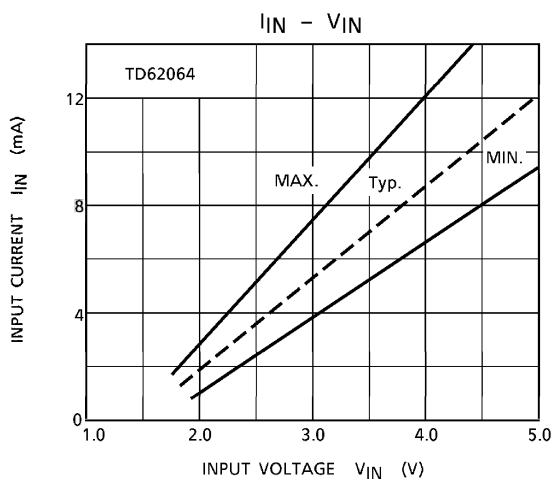
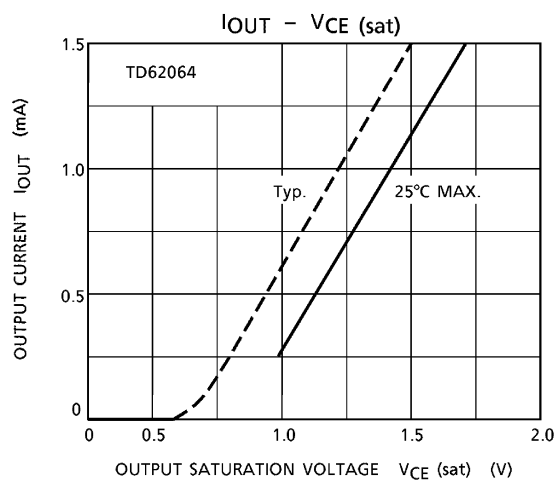
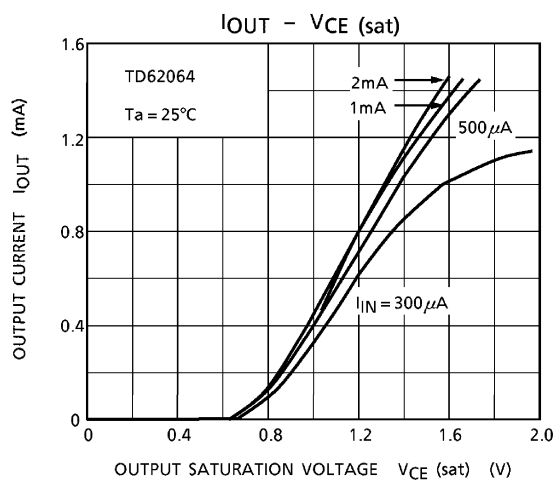
- (Note 1) Pulse Width  $50\mu s$ , Duty Cycle 10%  
Output Impedance  $50\Omega$ ,  $t_r \leq 5ns$ ,  $t_f \leq 10ns$   
(Note 2)  $C_L$  includes probe and jig capacitance

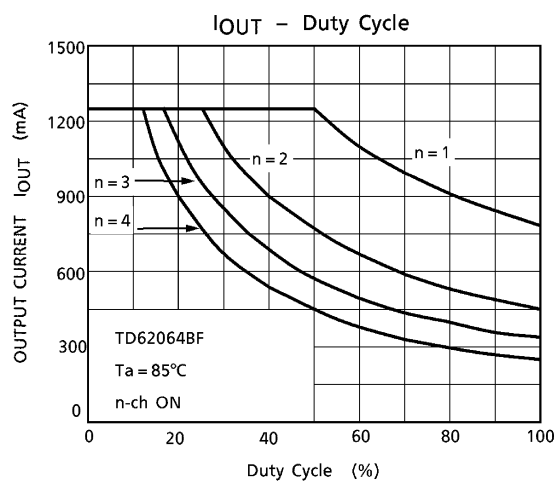
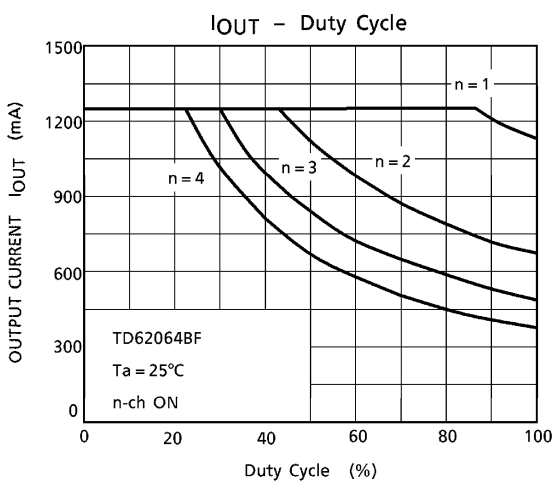
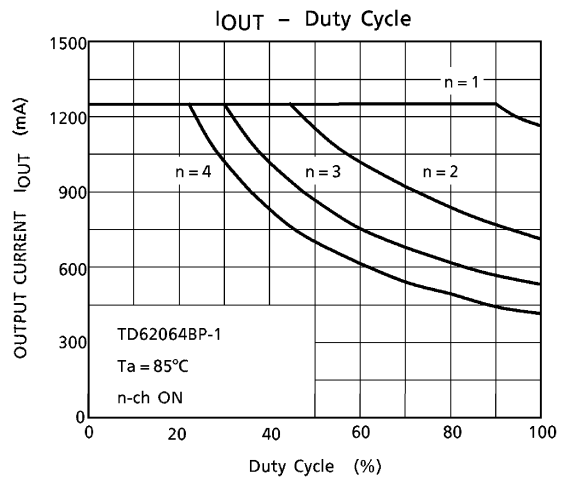
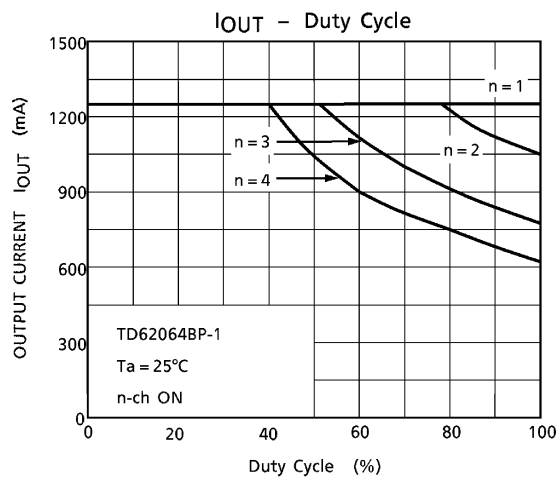
8.  $V_{cef}$



**PRECAUTIONS for USING**

Utmost care is necessary in the design of the output line, COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

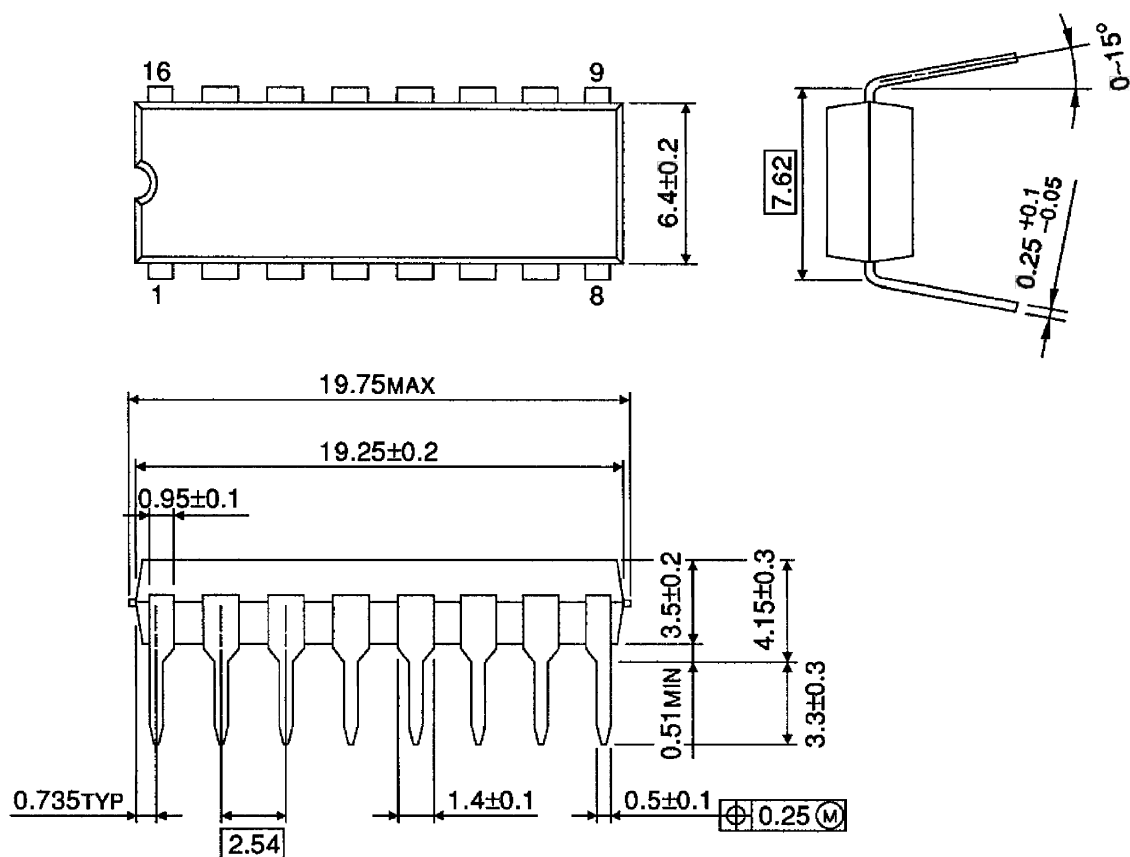




**OUTLINE DRAWING**

DIP16-P-300-2.54A

Unit : mm

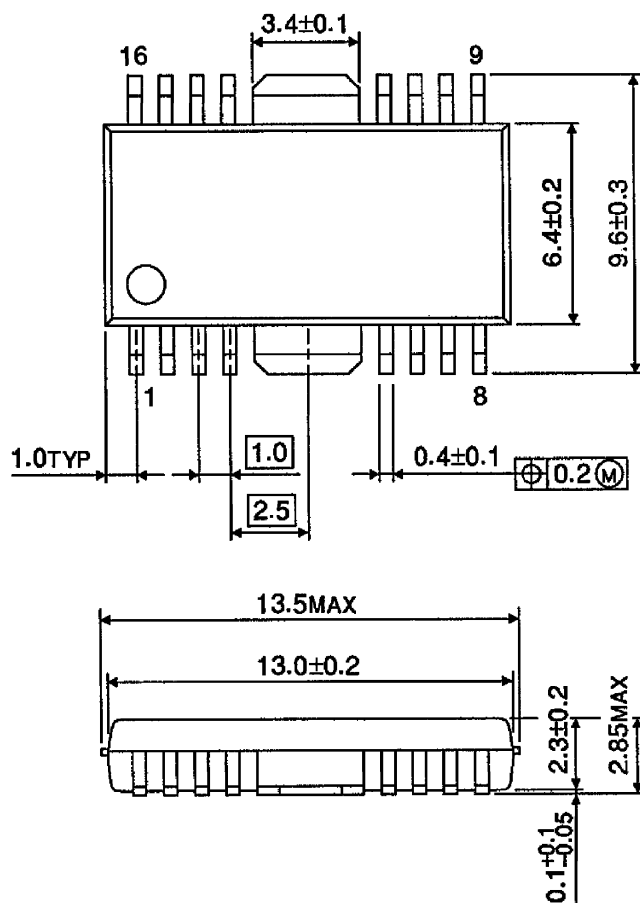


Weight : 1.11g (Typ.)

## OUTLINE DRAWING

HSOP16-P-300-1.00

Unit : mm



Weight : 0.50g (Typ.)

